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May 21, 1998

Arizona Corporation Commission
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DOCKETED BY

Mr. Ray T. Williamson
Acting Director
Utilities Division
Arizona Corporation Commission
1200 W. Washington
Phoenix, AZ 85007-2996

Dear Mr. Williamson:

Itron, Inc. is pleased to submit three copies of our comments on Statement of Position of the ACC Staff. Since Itron is in the business of developing and manufacturing systems for automated meter reading, we have restricted our comments to Section D of the statement which pertains to metering issues.

We will be available to address any questions you may have regarding this submission. We will also be available to provide testimony concerning this submission at the Open Meeting on June 3.

Sincerely,

Barry Goodstadt

Barry E. Goodstadt, Ph.D.
Vice President, Regulatory Affairs

BG/krp

Enclosure

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BEFORE THE ARIZONA CORPORATION COMMISSION

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Comments of Itron, Inc., Upon the Statement of Position of the ACC Staff

Submitted by

Barry E. Goodstadt, Ph.D.
Vice President

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May 21, 1998

I. Introduction

Itron, Inc. ("Itron") respectfully offers its advice and counsel bearing upon the Statement of Position of the ACC Staff. Itron is a leading supplier of automatic meter reading ("AMR") equipment and is knowledgeable and experienced with respect to the technology and economics of metering and meter reading. Given the company's background, our comments are restricted to issues surrounding section D. Metering and Billing.

Itron's knowledge and experience derive from:

(i) the design, manufacture, and provision of products and services for meter reading which are used by more utilities than those of any other vendor;

(ii) the successful interfacing of Itron's meter reading and data collection systems with the data processing systems of more than 1,300 electric, gas, and water utilities worldwide, including 20 of the 25 largest utilities in North America;

(iii) the technical information gained from customers around the world which read approximately 250 million meters with Itron's handheld meter reading systems;

(iv) the installation of more than eight network-based AMR systems in the U.S. and more than 11 million radio meter modules to support the automated capture of meter data from electric, gas and water meters.

(v) the provision of hardware and software for the collection and translation of data from diverse advanced meters for the industrial and large commercial customers of more than 460 utilities worldwide through Itron's subsidiary Utility Translation Systems, Inc. ("UTS"). UTS has played a significant role in two other crucial aspects of deregulated operations:

1) UTS was responsible for supplying support to the metering and meter reading functions in the United Kingdom during its on-going transition to competition in electric supply; and

2) UTS is also a software contractor for the Independent Systems Organizations (ISOs) in California, in Australia and in New Zealand. This background provides us with first-hand knowledge of the issues and problems encountered in the U.K.'s deregulation experience up to this point in time and offers us perspectives on leading edge issues associated with settlement problems for a major ISO.

It should be noted that Itron is currently quite active in serving electric, gas and water utilities within the Arizona including: Arizona Public Service, the Salt River Project, Tucson Electric, Southwest Gas, and the City of Phoenix among others..

Itron has been an active participant in the ongoing deregulation proceedings and metering working groups in California, Delaware, Maryland, Massachusetts, New York, Ohio and Pennsylvania. Itron has also participated in a modest way in Arizona through activities in conjunction with the Meter and Meter Reading Committee of the Unbundled Services and Standard Offer Working Group.

II. Itron's Understanding of the ACC Staff Position on Metering

As set forth in the ACC Staff Position Statement, the staff indicates that competitive metering will be offered to all customers having access to competitive generation service as of 1/1/99. In effect, this means that competitive metering will be available to all customers with 1 MW or greater who choose direct access or customers with $\geq$ 20 kW or greater who can be aggregated to 1 MW to participate in direct access. This would also mean that those residential customers who are phased in for eligibility for competitive service beginning 7/1/99 could also avail themselves of competitive metering services as their eligibility arises.

As outlined in the Staff Position document, competitive metering is seen as fostering a series of Commission goals including:

1. To ensure vigorous competition in the electric power market;
2. Promote efficient consumption of electric power;
3. To spur technological innovation;
4. To ease the transaction burden competitive access; and
5. To ensure reliability of the system.

III. Itron's Comments on the ACC Staff Position on Metering

After considerable study over the past two years in New York and in several other jurisdictions, Itron has identified a number of risks associated with establishing competitive metering. On the basis of these risks, Itron recommends that metering not be made competitive in the near term.

While there are a number of reasons for this recommendation, Itron's view is heavily influenced by evidence indicating that the implementation and operation of a competitive metering framework will increase the complexity of the metering structure, will result in a number of risks, will increase consumers costs and will therefore reduce the potential for energy savings. In the end, these consequences of competitive metering will constrain the effectiveness of competition.

Itron's perspective is consistent with a recent article by Ahmad Faruqui and Laurence Kirsch (Unbundling Electric Discos Overseas and at Home", pp. 41-45,

April 1, 1998) in *Public Utilities Fortnightly* which suggests that it is feasible to unbundle distribution services, but that such unbundling will lead to higher rates and greater complexity. Itron's position is also compatible with the recent NARUC "White Paper on Metering" prepared by Plexus Research (March 31, 1998) which highlights some of the difficulties which emerge when meter reading was deregulated in the U.K. and suggests that one single entity (the UDC) take responsibility for ensuring integrity of the metering system. A copy of the conclusions sections of this white paper is included in the Appendix.

Itron's reasoning for our recommendation is as follows:

1. Experience in competitive metering above 100 kW in the U.K. reveals that this process was fraught with difficulties and led to late meter reading and inaccurate billing. In the UK, the net impact of competitive metering was to introduce a delay in further roll-out of generation competition for the under 100 kW segment from April, 1997 until September, 1998. In effect, **in the UK, competitive metering impeded competition, increased the burden of competitive access, and decreased reliability--principles which the ACC correctly believes are important.** This suggests that careful planning is needed to minimize such risks, but the time remaining until 1/1/99 is far too short for a meaningful and effective planning effort.

2. Working groups in other states (e.g., New York) have determined that efforts to establish competitive metering are feasible, however, such efforts will lead to duplication of various functions. Competitive metering will also lead to increased costs associated with certification of Meter Service Providers (MSPs) and establishment of Meter Data Management Agent (MDMA) certification as well as UDC servers to communicate with MDMAs.

3. At the outset of competition on 1/1/99, the number of affected customers will be quite small, nevertheless an extensive infrastructure to support competitive metering will need to be established by that point in time. Such an infrastructure will involve expenditure of significant fixed costs including computer and communication systems and mechanisms for certification of MSPs and MDMAs.

4. Competitive metering will disrupt the existing economies of scale in metering operations which are driven by population density. As the density of served meters declines due to competition, the costs of metering for individual customers will inevitably rise.

5. The ACC goals include "spur[ring] technological innovation. It should be noted that key components of metering technology are already competitive and there are a number of providers of this technology including Itron, Schlumberger, CellNet and others. This existing competitive manufacturing and systems

development industry supporting this technology already makes it possible to drive down costs and provide innovative solutions for metering. Delivery of metering services is a separate market with its own cost structure which is rooted on economies of scale and in population density. Opening meter data collection to competition will not, therefore, by itself, reduce costs.

6. Proponents of competitive metering have argued that new metering systems such as AMR will provide consumers with an array of added value services. This promise is unfounded and Itron is aware of no demonstrations of consumer-oriented added value services which operate either through the meter or through AMR networks. AMR networks have been shown to provide added value to distribution utilities (such as outage detection and information for distribution planning), but these offerings provide limited direct benefit to end users.

7. Opening up metering to competition in the near-term would appear to offer opportunities to few, if any, energy service providers. Independent of whether any energy service providers offer metering services, the costs of establishing a competitive framework will still impact consumers. If no energy service providers offer competitive metering, ratepayers will be forced to pay for the competitive meter structure (e.g., UDC services, MSP and MDMA certification procedures) in exchange for no benefits.

8. Much of the discussion in the metering working group has centered on developing structures which have been deployed in the California market. It is not clear, at this time, however, whether the competitive metering structure developed in California is now or will ever be effective and nor is it now clear what costs will be incurred by the utilities and the ratepayers to establish such an infrastructure.

9. One major area of consensus among all participants in the deregulation process appears to be that both energy service providers and distribution utilities need timely access to meter data. The sharing of such data, however, does not require the costly establishment of a competitive metering framework. Such sharing of information could be readily accommodated through incremental changes to existing utility metering and data systems.

10. A number of states have considered the possibility of creating a competitive metering environment in conjunction with deregulating the electric supply market. Only California has decided to simultaneously create competition in both generation and metering for all customers. Other states have rejected this notion and had determined that a more prudent course of action is to create competition in electric supply first and then determine whether and if so, when and how to create a competitive metering environment.

Details regarding Itron's reasoning follows:

1. **Experience in competitive metering in the UK, reveals that there were a number of operational difficulties were associated with the simultaneous deregulation of both supply and metering when the UK launched its deregulation initiatives.** That is, competition in metering was plagued by delayed meter installations, the lack of availability of communications facilities prior to market initiation and a lack of meter registration. As a consequence, data were missing, a considerable amount of estimation was required, settlements were inaccurate, and bills were late and incorrect. In response to these problems, the initial plans for rollout of deregulated supply below 100 kW were delayed from April 1997 to the Fall, 1998. Thus, it would appear that the attempt to provide competition in metering has resulted in a delay in supply deregulation.

   The experiences with competitive metering in the UK appear to run counter to the desired goals of the ACC in terms of ensuring vigorous competition, easing the transaction burden of competitive access and ensuring system reliability.

2. **A major conclusion from metering working groups in other states is that competitive metering is feasible but will add complexity, extensive coordination and cost to the metering process.** For example, the New York working group went to great pains to develop detailed descriptions of the considerations which would come into play should the Commission decide to establish competitive metering. It is clear from the report that, in a competitive environment,

multiple parties rather than a single party will be involved in managing the metering process and control of end-points. This fragmentation of the process will lead to duplication of effort, will add costs to the process and will open up the system to potential risks if not handled properly. For example, to support competitive metering, a system for automated sharing of data will need to be established; this will lead to additional costs to be shared by all ratepayers and parties to the electric transaction. Similarly, a single control entity needs to be developed to track meter removals, installs, replacements and accuracy testing. At the same time, sealing and locking of meters must still take place and must be coordinated between different parties. Site inspections, validation of meter data and auditing procedures will still be needed to maintain the appropriate level of system quality and these activities will need to be coordinated between different parties. Finally, certification of meter service providers will need to be carried out whether by a state entity or by some other party and will involve additional costs which are not now being incurred. To the extent that these costs are significant, the value of competitive metering is lessened.

3. **At the outset of competition on 1/1/99, the number of affected consumers will be small and the establishment of a competitive metering infrastructure will be quite costly relative to the number of customers involved.** Despite the fact that during the initial stages of competition, few customers will be addressed by competition, the ACC's position is that competitive metering needs to be available immediately. The underlying problem in this approach is that

establishing a competitive metering infrastructure is a highly complex undertaking and will involve considerable upfront costs. This infrastructure will involve such functions as data sharing mechanisms (i.e., computer servers), establishing standards for credentials of meter service providers and of meter data management agents, certification of such entities as well as a process for adjudicating disputes over the veracity of data gathered through different systems by different parties. This infrastructure will result in duplication of functions to support competitive metering providers; functions which would not be entailed were competitive metering not initiated at this time.

4. **Competitive metering will disrupt the existing economies of scale in meter data collection and will lead to metering price increases.** The costs of existing meter data collection for residential and small commercial accounts (whether they involve meter readers on foot or radio-based technology) are greatly determined by population density. Because of the degree of market saturation and on the basis of economies of scale derived from population density, the typical meter data collection systems can deliver monthly meter readings at a cost of between $.75 and $1.00 per meter per month. If competitive metering is brought into play, fragmentation of the market will occur and will lead to diminished population density for meter reading by any one provider. That being the case, the cost of meter reading will rise. If one doubts this principle, one need only reflect on the prices for ESP metering posted by the UDCs in California. These prices are

considerably higher than current utility metering because they reflect the fact that economies of scale in meter data collection will be lessened.

In the past, several parties have argued in favor of competitive metering on the basis that competition in metering will result in reduced data collection costs. This assertion is incorrect. The analogy used by these parties is that the telephone industry (specifically long distance service) has experienced reductions in price due to competitive pressure. Long distance service has indeed experienced dramatic price declines; however, local service has not experienced price reduction. Despite the fact that several states now permit competition in local service, competition has not emerged extensively in local telephony because competitors do not want to invest in building the infrastructure needed to service "the last mile" in the local loop. The economics inherent in the "last mile" are, like metering, based upon population density. That is, the services cannot be competitively cost effective unless they can comprehensively cover a defined geographic area with reasonably high levels of population density. Thus, the analogy of long distance service does not apply to the situation of metering data collection since the economics of long distance service are not rooted in population density considerations.

5. **Key components of metering technology are already competitive.** One of the arguments used by those who wish to have metering become competitive is that competitive metering will result in the introduction of innovation and new

technology in the marketplace. The reality is that metering technology is already a competitive and unregulated business. A number of manufacturers currently offer an array of inexpensive as well as more fully-featured meters. In addition, automated metering system providers such as Itron offer a variety of different technologies which are matched to the varied requirements of different customers. Thus, the providers of metering technology are serving a world-wide market consisting of several thousand electric, gas and water utilities. Since this is a highly competitive marketplace, new products are continually being brought to the market to meet the needs of a broad array of utilities. Establishing metering competition will not result in any new or different array of metering product offerings other than those which are already under development for the larger marketplace.

6. **New metering systems will not provide added value directly to consumers.** It has been argued by proponents of competitive metering that new metering competitors will enter the market and will, through metering systems and networks, directly provide consumers with an array of added value features and services which go beyond energy management such as home security, internet access and messaging. Promises of a glorious future derived through the metering as a gateway for new services are unfounded. Itron tracks metering applications and technology quite extensively throughout the world and is not aware of any viable, non-energy application currently being delivered to end-users through metering systems or metering networks. Indeed, all of the

applications promised by Enron in its filings could more cost effectively and efficiently be delivered through existing infrastructure other than the metering system (e.g. telephony, cable systems). Enron promised such applications in its testimony and filings in California and succeeded in having metering made competitive in that state, only to drop out of the residential market after three weeks. The ACC needs to ask not only whether such applications are viable and efficient when operated through a metering gateway but whether any provider would stay in the market and actually offer such services.

7. **Competitive metering would open up opportunities for only a small number of energy service providers, and the competitive metering infrastructure will raise costs for consumers.** It is apparent that energy service provider (ESPs) requirements for metering are varied. Some ESPs want to own meters and gather their own metering data; other ESPs only want to obtain metering data without being involved in the metering function. That being the case, it is apparent that only a handful, if any, ESPs would avail themselves of the opportunity to provide competitive metering. Furthermore, in light of the recent withdrawal of Enron from participation in the residential market in California and in several other states, the proposition for competitive metering would appear to have little in the way of credible support from likely metering market participants. One must ask whether all of the changes which must take place to create a competitive meter infrastructure are truly worth the effort and cost if very few ESPs participate. If no one opts to provide competitive metering,

ratepayers will still be exposed to all of the costs which must be incurred to establish a competitive metering structure (e.g., servers to provide for complex data sharing, certification of meter service providers, a structure to track meter changes and so on). It should be noted that not all the costs associated with establishing a competitive metering structure in California have been visible. These "hidden" costs are identified by California UDCs filings submitted on May 14 (Section 376 filings) and are likely to be significant since they include the computer systems for sharing data among various parties and the costs of certifying meter service providers and meter data management agents. The 376 filings cover costs associated with deregulation which are attributable to all ratepayers. These costs are in addition to the Competitive Transition Charges (CTC) which are used to cover generation stranded costs. Itron is currently in the process of studying these filings to learn lessons which may be of use to others wrestling with these issues.

8. **Basing a competitive metering structure on the California model may be problematic.** Much of the discussion in the ACC's working group has centered on developments and structures established in California. While it is correct that California is the only extant model for competitive metering in this country, it is not clear how effective this model will be or what costs will be imposed on ratepayers. For this reason, Itron urges caution in wholesale adoption of the California structures for use in state and recommends that the Commission

carefully weigh the costs of competitive metering which emerge from such structures.

9. **ESPs and distribution utilities all need timely access to meter data; such information flows can be accommodated by incremental changes to distribution utility systems.** It is clear that both ESPs and distribution utilities have a common need for rapid assembly and access to meter data. Distribution utilities can provide access to such data with incremental changes to existing systems without having to establish a all of the facilities and structures required for competitive metering. By requiring distribution utilities to provide such data as would be needed by ESPs would go a long way toward providing the necessary support for a competitive generation market. This would not necessitate unbundling of and competition in metering.

10. **Only California has decided to simultaneously create competition in electric supply and in metering for all customers; numerous other states have decided that this is not a prudent course of action.** The other states which have determined that opening metering to competition is not a necessary condition for electric supply competition are the following:

    - Connecticut
    - Delaware
    - Illinois

- Maine
- Maryland
- Massachusetts
- Minnesota
- Montana
- New Jersey
- New York
- Pennsylvania
- Rhode Island

IV. Conclusions and Recommendations

On the basis of the foregoing, Itron concludes that metering should not become competitive in the very near term. That is, we believe it will be more prudent to delay metering competition until such time as electric supply competition is significant. Accordingly, Itron recommends that the ACC take its time in performing a careful review of all of the facts emerging in Arizona, in California and elsewhere to ensure that the risks associated with competitive metering are fully understood and that appropriate steps are taken to mitigate such risks should the Commission decide to proceed with competition in metering.

Appendix

Conclusions from NARUC White Paper on Metering

Prepared by Plexus Research

6.2 Conclusions & Recommendations in Short Form

6.2.1 Meter Ownership

The prevailing uncertainty about future meter ownership regulations is a principal roadblock to deployment of advanced metering and meter communications technologies. States must establish with prudent haste who shall or may have responsibility for the physical on-premise metering.

Central issues are:

a) The consumer and those parties the consumer designates must have access to the meter data, which must otherwise be protected.

b) The consumer must have access to new metering with desirable features not found in more rudimentary but otherwise acceptable systems.

c) The meter must remain compatible with the prevailing infrastructure for energy delivery and meter data collection and processing.

d) Meter calibration, programming and maintenance must be performed by appropriately skilled personnel using properly calibrated and test equipment.

e) Those entities performing calibration, programming or maintenance must be accountable to proper authority (not the customer) for the quality of work.

f) Meters must be sealed with traceable seals both as a unit and as installed. (Note that the "meter" is the calibrated measurement device, which does not necessarily include processing and communications of the meter data.)

g) The consumer and other interested parties must have legal recourse in cases of fraud.

If these are assured, anyone can "own" the meter.

The requirement that hourly data must be retrieved frequently, typically daily, dictates that data be retrieved remotely and automatically. This requires an automatic meter reading (AMR) system. Who should own and operate this system? Should it be considered *part* of the meter? At this time a variety of prominent AMR systems employ single purpose communications infrastructures which can acquire metering data most

economically when the communications system infrastructure cost is shared by all customers in a geographic area.

These favorable economics deteriorate when a multiplicity of incompatible metering/AMR systems serve the same geography. This phenomenon provides an argument for allowing a single entity to deploy the most economically sound metering implementation for the benefit of all parties. A counterpoint is that other technologies exist (using telephone, paging, etc.) which are not dependent upon a shared infrastructure dedicated to AMR, albeit that their costs may be currently higher due to lower production volumes and other factors.

Economies of scale will develop for these other technologies as the electric industry restructures nationally and their other markets expand, and prices will become more comparable between dedicated and multi-purpose networks.

Recommendation:

Establish the authority to assure integrity of the metering function (installation, record keeping, calibration and maintenance) in one entity within the regulatory jurisdiction. That entity may best be the UDC at first or indefinitely, but other participants in this process are possible and workable. UDCs who are interested in retaining metering and revenue services under performance-based regulation should be required to show how and why they would meet the current and future needs of all market participants. This presentation should be subject to normal comment by all interested parties.

Define the "meter" as that device which measures and records basic parameters of electric usage. This device may, or may not, be separable from further processing and communications devices. If separate or separable, consideration must be given to the "hand-off" when a customer changes suppliers. The calibration entity must have unilateral control of access to this "meter," for example, by locking it with a seal as is current practice.

If a state wishes to assure hourly metering for most or all of its consumers in the shortest possible time at the least cost per site, it will find that requiring the UDC, possibly in contract or collaboration with a third party, will achieve this result with higher probability of success than most alternatives. If a state prefers to allow market forces over several years to determine which customers will be hourly metered and which will be profiled, or wishes to defer making any long term decision, that state is advised either to unbundle metering and revenue services (as in California) or to examine the matter further, leaving metering in the hands of the UDC for the time being (as in Massachusetts).

6.2.2 Data Flow Requirements

The technical data communication requirements are largely independent of the particulars of industry restructuring. Meter data must be

communicated from the customer site to many specific locations, while maintaining integrity and security. Current and emerging technologies are suitable and will expand in ability to meet this requirement. Standardized data formats must be established for the interchange of data between the entities which share responsibility for serving the consumers. (See recommendation related to Standards, below.)

6.2.3 Data Access & Security

A number of parties need access to meter data to execute the transactions of the open electric market. The customer is entitled to the data, and will make productive use of it in many cases. There is no evident reason to make individual customer data publicly available, but public access to aggregated customer data and to load profiles will allow checks and balances on the entire process.

Technical methods to assure data security during transport from the customer site to others (e.g., the customer's chosen energy service provider [ESP]) are emerging now and will become standardized as part of the overall communications protocol standardization process.

Data quality also is a security issue. Traditional utilities have well established methods to validate metering and load data. Parties not experienced in such data handling are unlikely to anticipate the extent of such validation required. This may pose significant difficulty in the settlement and billing process.

Recommendation:

Establish that access to individual consumers' data is limited to those that must have it to provide the customer's chosen electric service, and such others as the customer may explicitly authorize. Require that aggregated data and load profiles are open to all upon request.

Require that existing utility practices for assuring meter and load profile data validity be codified into rules which govern the handling of all data used for determining electric billing and load profiling.

6.2.4 Hourly Metering for Which Customers?

Selecting any electric demand threshold above which all customers are required to install hourly metering presents the practical difficulty of rapidly installing qualified metering. If the threshold is set high enough to avoid this, the requirement becomes moot.

Recommendation:

Let every customer choose whether to be hourly metered or to participate in the applicable load profile class. Require those customers that are hourly metered now to remain so. This is to prevent large customers with high

on-peak loads from joining a load profile class to the disadvantage of other customers in the class.

Some customers will find participation in the load profile class disadvantageous. They may purchase hourly metering services at their own expense. The cost of metering is low enough (and is falling) that many customers will achieve a reasonable return on the investment. Residential customers that choose to be metered hourly may pay for the metering through a bundled deal with their ESPs. Require customers that choose hourly metering to retain it.

In essence, this recommendation is: Require hourly metered customers to continue with this method. But let the ESPs offer to other customers whichever metering/billing method they (the ESPs and the customers) choose. The market will settle the matter satisfactorily.

6.2.5 Meter Data Communication Standards

Great benefit is gained by standardizing data communication across all jurisdictions in all states. Products conforming to national standards are now available for accessing meter data that are stored in centralized databases. Standards for communicating directly with meters are just emerging and require some further development. This development is occurring and already has significant momentum. However, many of the currently deployed or commercially available products and systems use proprietary interfaces at the meter level. Suppliers are understandably reluctant to incur the significant costs of redesign or to adopt interfaces inconsistent with their design philosophies. The State of California has studied this matter carefully, reached valid conclusions, and defined a process for coordinating completion of the standards. Many of the participants in this process represent national, rather than regional, interests.

Data security is one of many issues addressed when standardizing communication protocols. The most effective way to assure meter data security is to support protocol standardization.

Recommendation:

It would be foolish and counterproductive for each state to attempt to develop and impose standards which are more effectively established on a national basis. Considerable effort has been directed to this matter in California. Discuss the possibility of expanding its standardization process to national scope with the California Public Utility Commission. Each state should encourage concerned parties to participate in the process. Adopt appropriate nationally recognized standards as they become sufficiently complete.

6.2.6 Adequacy of Existing Load Research Data for Load Profiling

Substantial load research data exist in all regions of the country which can support load profiling as an alternative to hourly metering every customer site. The equity of profiling is not authoritatively established at this time. The EPRI Center for Electric End-use Data (CEED) in Portland, Oregon has assembled a large body of additional data that can provide valuable insights into all aspects of profiling.

Most utilities have acquired and maintained statistical load research data to support cost of service studies and rate setting. In some cases these data support a very limited suite of customer classes, typically only those classes covered by current tariffs. It remains to be seen if these classes will be sufficient to equitably represent the wide diversity of climate variations in a region, appliance mixes, shifting occupancy patterns, etc. Certainly consumers who feel they are penalized by a profile class which overstates the cost of serving them will have an incentive to elect hourly metering.

Load profiling *on average* may result in little change in consumer's electric bills. It may, or may not, result in changes (up or down) in some consumer's bills. The extent of such changes is unknown now, and can be determined only by detailed study. Initial work to address this is in process now at CEED. It will completed by mid-1998. Further work will be required to assure improved equity in the load profiling process.

Recommendation:

Charter the existing franchised utilities, or other qualified entities, to define and refine customer classes and their load profiles using available and newly acquired data. Make provisions for expanding and refining this process. This is not an immediate or inexpensive matter, so incentives must exist for those charged with this process. Make the results publicly available. Investigate further approaches to improving the equity of load profiling.

6.2.7 Load Profiling Compared to Metering

Hourly metering and simple load profiling cost about the same to conduct, but metering has a much higher start-up cost now. In the residential sector, start-up costs for profiling are about $25 per customer, compared to roughly $100 to $250 for hourly metering. Simple load profiling may not be adequately fair to all customers as some "opt out" of profiling by acquiring hourly meters. Fairness can be improved by defining more load profile classes, and by updating the load profiles more often, even daily. This raises the cost of profiling relative to metering. Meanwhile the cost of hourly metering is falling.

If the electric market is to be restructured now, there is little choice but to use load profiling at all sites that don't have hourly metering. The cost of hourly metering is low enough to be justified for customers whose actual load profiles differ substantially from their class load profile. Class load profiles may remain adequately fair and most economical indefinitely for some customers with moderate consumption that is similar in profile to others in their class.

6.2.8 Cherry Picking & System Gaming

Until universal interval metering for all customers becomes a reality, some amount of system gaming and cherry picking of customers will occur. Profiling provides a window of profit opportunity; and where profit opportunity exists marketers will rush to take advantage. No market is perfect. Arbitrage in the financial securities market is a legitimate business based on imperfections and imbalances in market mechanisms. Profiling is such an imperfection in a restructured electric marketplace. Its effects can be mitigated by frequently updating and maintaining profiles that most accurately reflect actual usage patterns for the customer profile classes.

6.2.9 Value Added Services

There is considerable promotional press about the benefits of "value-added services" for consumers. Some energy providers believe that the energy supplier will become a conduit for a cornucopia of other profitable new services, such as local telephone bypass, security alarm monitoring, entertainment, Internet access. etc. All of this is technically possible, as has been demonstrated in various pilot installations. Communications technology and microelectronics will make these offerings more likely to succeed in the years to come. But hype and high expectations have greatly exceeded current reality. Metering and meter data communications are extremely cost sensitive, and meet very special requirements. It should not be assumed as a matter of policy that remote metering systems are necessarily related to, or even a useful conduit for, these other services.

6.2.10 Lessons Learned

Two major conclusions can be drawn from the restructuring experiences in the United Kingdom. First, metering issues are not trivial to the ultimate success of open access. Without proper and due consideration to metering and meter data management, details like calibration, data ownership, and identification of customers and delivery points, confusion will reign. Customer skepticism and dissatisfaction with the process will result. The recent delay in California's competitive electricity market due to inadequate data management system testing reinforces this conclusion.

Second, profiling is a necessary short term substitute for hourly metering to achieve universal open access for all customer classes. It is neither perfect nor cheap. It does not achieve all of the goals of restructuring, like improved energy management and efficient resource utilization. It can lead to inequities within profile classes. But it is necessary for restructuring to move forward in the short term, and it may be the most economical and effective approach for some customers in the long term.

6.2.11 Recourse of Aggrieved Parties

It is possible that load profiling will present serious inequities for some monthly-metered residential customers. Consider two neighbors in identical houses with identical electric consumption profiles, but served by two different electric distribution systems. Each is in a load profile class defined by the aggregate of residential customers on that distribution system. These profiles may differ substantially. Suppose that both buy energy from the same ESP. If they pay the same price, the ESP will be have to balance a loss on one customer against a gain on the other. Alternatively the ESP may charge them different rates. Either case presents important problems.

Recommendation:

Define a sequence of recourse actions available to parties that believe the restructured electric environment puts them at a disadvantage they consider untenable. It will be helpful to have some appeal process before resorting to litigation.

6.2.12 Universal Customer Identification

Processes for energy accounting and financial settlement will be greatly facilitated by assigning permanent identifiers to individual electric customers, premises and meters. Considerable confusion may arise when a customer changes premises (and therefore also changes load profile classes) and/or changes energy service providers. This confusion may result in unrecoverable errors in financial transactions.

Recommendation:

Investigate the requirements and alternatives for universal identifiers, and take subsequent action as appropriate.

6.2.13 Hourly vs. Demand Metering

Throughout this paper we have assumed that because electric energy is priced hourly in the wholesale market, it should and will be similarly priced in the retail market. Further we have assumed that economic

efficiency and customers are best served if wholesale price variations are reflected in retail prices. This is conventional economic theory.

During the comment period for this report it was suggested that another view may be equally valid. It may be that, in the retail market, most of the benefit of hourly metering can be gained with demand metering, for a fraction of the hourly metering cost. The approach would be as follows. Meter residential sites for daily or monthly demand and energy consumption instead of hourly consumption. The demand meters record two values each day or month: the kWh of energy consumed, and the maximum rate at which energy was drawn, that is, the maximum demand. Reading these two values monthly might reflect the costs the customer incurs nearly as accurately as collecting 720 hourly meter readings per month. Or perhaps reading demand and energy daily—60 values per month—would be required. This still is much less communication and processing than required by hourly metering.

The reasoning for this view is that the energy itself constitutes only about one third of the cost of service. The remainder is transmission and distribution (T&D) and other services. Though energy price varies hourly, T&D cost is fixed by peak demand. From this viewpoint, peak demand is at least as important as hourly consumption, and may be much more important. If so, the significant costs of meter communications infrastructure might be greatly reduced, as would the volume and costs of data processing.

Recommendation:

It was impossible to examine the merits of this view during the study. We recommend that NARUC charter a serious examination of this position.